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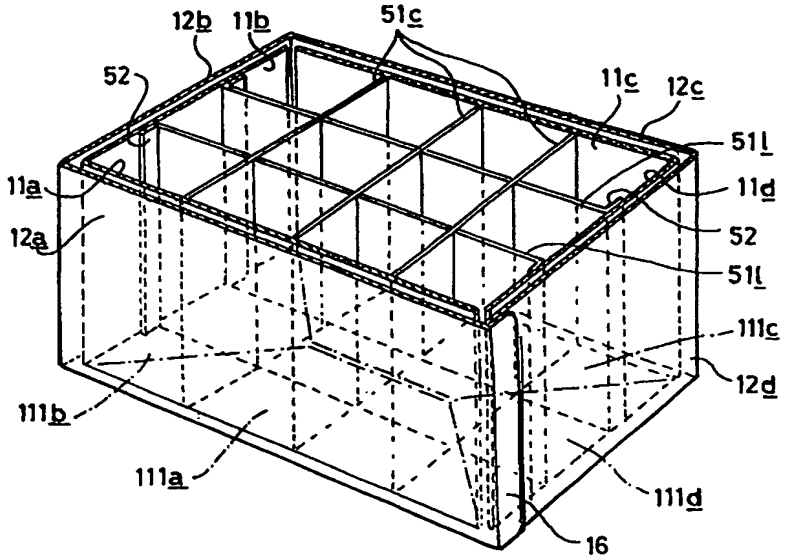
(54) Title: CARTON, AND BLANK THEREFOR



(57) Abstract

Box–like cartons intended to carry bottles and the like conveniently have interior space dividers. The present invention is to use cartons of the "archive" type, where, because of the way they are intended to be erected (giving them adouble–skinned structure (11, 12), in their collapsed state the b ottom/top portions (111, 112) lie outside rather than between theinside walls (11), and as the carton is erected these bottom/top portions fold and move into position without passing through the interior space of the carton. Thus, the spacer divider strips (51) can be located in position within the collapsed carton withoutbeing in the way.

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Carton, and blank therefor

This invention relates to a carton, and concerns in particular a carton of card or the like made by erecting a suitably cut, creased and folded blank.

Erectable cartons or boxes, of the sort referred to generally as "cardboard boxes" (although in fact they can be made of materials other than cardboard), are of great value in the packaging industry, for they may be preformed then stored in their space-saving un-erected (collapsed) state, only being opened up (and usually further folded and interlocked) and erected into their use state immediately prior to their actual utilisation.

Conventionally, such a box or carton is manufactured from a sheet of the relevant material in a number of stages. First, the sheet is cut and creased to form what is known as a "blank"; the cuts and creases both mark out the relevant portions of the carton - panels which will form the carton's front, rear and side walls, its top and bottom surfaces, and any necessary flaps and tongues and slots, and so provide the blank with the shape that will define the carton formed therefrom - and also are such as to enable the basically flat sheet to be folded in the way required to construct the desired three-dimensional carton. The blank may be of the "base" type, with a central panel (to form the bottom of the carton) having wall and top panel extensions disposed around it, or it may be of the "peripheral" type, with a sequence of side-by-side panels (to form the walls of the carton) having base and top panels extending therefrom. A "peripheral"

construction commonly requires one flap-like part of the blank to be permanently affixed - by glue or staples, for instance - to another part (usually one of the areas of the blank defining a wall of the carton); the next, stage, then, is to effect this fixation, and the blank is conveniently designed so that this can be done with only a single fold of the blank, and in such a way that what is formed is a flat, easily storable, "collapsed" version of the carton (strictly speaking, this folded and affixed "pre-form" is better described as an "un-erected" version, but in the Art such pre-forms are conventionally referred to as "collapsed"). Finally, when required for use the folded and affixed blank is opened up and then further folded (along the provided creases) so as to move the various wall and top and bottom portions into their required carton-defining positions.

Two typical examples of such a carton are that having the International Fibreboard Case Code 0714 (as adopted by FEFCO and ASSCO) and that variously known (in America) as a "Page 'Miracle'" box (because it is a "miracle" of the packaging art) and as an "archive" box (because it is used primarily for the archiving - the long-term storage - of office files, etc). Drawings of the blanks for these are shown as Figures 1A and 2A (respectively: Figures 1B and 2B show the cartons erected from these blanks) of the accompanying Drawings. These Figures - and the blanks and the cartons formed therefrom - are discussed in more detail hereinafter. Here it is perhaps worth pointing out that the Figure 1 carton is erected from a blank which, in its collapsed state, has its floor/base portions folded upwards to lie against its inner wall surfaces, and upon erection these portions are encouraged to drop down into place, passing - as they do so - through the volume that is the inside

of the carton. Such a blank and carton is very common. By contrast, the Figure 2 "archive" carton is made from a comparatively uncommon type of blank which, in its collapsed state, has its floor/base portions extending *down*wards, to lie away from its inner wall surfaces, and upon erection these portions are pushed *up* into place, a movement which does not require them to pass through the internal volume of the carton. This Figure 2 carton, which was in vogue in the States during the 1970s, but seems not to be in recent use anywhere, is of a particularly interesting variety, in that its erection - as discussed hereinafter - involves pushing one box-like subsection down into a second, and so converts the blank into a double-walled, double-based carton having not only considerable strength and rigidity (thanks to its double-skinned nature) but also its inside and outside surfaces the same (because they both come from what was originally the same surface of the blank).

Many of the available box-like cartons are multipurpose containers, and one particular such purpose is to carry bottles, for which purpose a double-skinned carton of the "archive" type mentioned above would be of particular value, owing to its inherent strength (although in general such cartons do not seemed to be used for carrying bottles). The bottles may range in size from 250ml beer bottles through 75cl wine bottles up to 2 litre bottles of soft drinks, disposed in regular arrays of two, four, six, eight, nine, twelve, fifteen, twenty-four and more (usually as groups of 2x1, 2x2, 3x2, 4x2, 3x3, 5x2, 4x3, 5x3, 6x4 and so on). If the carton is indeed to be used for this type of purpose then it is convenient to provide it with interior space dividers - slotted card strips that fit together to make an appropriate array of rectangular cells into each of

which a bottle fits - and thus to prevent the bottles when *in situ* rattling around in the box.

Now, when making such a spacer-utilising carton it is clear that the carton can first be erected, to form an empty box, and that then the cellular array of spacers can be assembled and placed inside the carton. It would be advantageous, though, if the spacer array could be provided, both pre-assembled and pre-positioned, within the carton - or, rather, within and as "part of" the collapsed form of the carton - so that the very act of erecting the carton simultaneously opens out the array and deploys it correctly positioned therein. It is this problem that the present invention seeks to solve.

It might at first sight seem relatively easy to achieve the stated desideratum, but a moment's reflection reveals that it is not so. The difficulty stems from the manner in which most cartons are formed - the way in which they are folded flat in their collapsed state, and the way in which they must then be unfolded as they are erected to make the final carton. Most cartons are of the general type of that shown in Figure 1; their bottom and/or top portions lie, in the collapsed state, between the carton's walls, and as the carton is erected they must move down and/or up, reaching their final bottom/top positions by passing through the empty space forming the volume of the carton. Obviously, if this empty space is, as it were, "full" of spacer divider strips, then it is going to be difficult - indeed, impossible - to move the bottom/top portions from their stowed, collapsed, positions to their fully deployed positions. The solution, suggested by the present invention, is to abandon the use of Figure 1-type cartons and move instead to cartons of the

Figure 2 "archive" type, where, because of the way they are intended to be erected (giving them a double-skinned structure), in their collapsed state the bottom/top portions lie outside rather than between the walls, and as the carton is erected these bottom/top portions fold and move into position without passing through the interior space of the carton. Thus, the spacer divider strips can be located in position within the collapsed carton at what will become the carton's interior space without being in the way of the carton's bottom/top portions as these latter move into position during the erection sequence.

In one aspect, therefore, this invention provides a collapsed carton of the "archive" type, and an erected carton formed therefrom, wherein fixedly located in position within the portion forming the inner section of the carton are spacer strips disposed to define a cellular array of spaces within the erected carton.

The invention provides a carton - either a collapsed carton or an erected carton - of the "archive" type. By this is meant not that the carton need be *exactly* like any particular "archive" carton but that it is of this *general* type. The blank for such a carton is usually an elongate oblong in overall shape, and has along one of its long sides those portions (or panels) which form the four side wall surfaces (the two ends and the left and right sides) of the inner section and along the other of its long sides those portions (or panels) which form the four side wall surfaces of the outer section, these two sets of four panel portions being joined by a matching set of four pairs (two sets of four) of "facing" trapezium portions (each pair mounted

with the shorter of the two parallel sides together along a line that is the central long axis of the blank and the longer sides adjacent the related side portion), which trapezium portions fold, concertina-fashion and in an interlocking manner, to form the bottoms of the inner and outer box sections. An instance of such a blank is shown in Figure 2A. The carton can be provided with one or more closure flaps, these extending suitably from the relevant lengths of the "free" edge of the panels forming the four side walls of the outer section.

Obviously, the carton - and thus the blank - can of of any suitable size. For carrying a dozen claret or burgundy wine bottles, or spirit bottles, in a 4x3 cell array an appropriate size - for the erected box - is roughly 12½x9½x14in (31x24x30cm) long-by-wide-by-deep, giving individual cells of about 3x3in (7.5x7.5cm).

Fixedly located in position within the part forming the inner section of the carton are spacer/divider strips disposed to define - to divide the interior of the erected carton into - a cellular array of spaces within the erected carton. The spacer strips may be of any height, but will typically be conventional part- or whole-height strips of card slotted to enable them to be fitted together to define the required array of cells. A 4x3 cell array is thus defined by two long strips (extending in the "4" direction) and three shorter strips (extending in the orthogonal "3" direction). The strips may be located "fixedly" in any convenient way - it is preferred to give some of the strips flaps at each end which in use lie flush against the relevant strip-normal inside wall surfaces of the inner box section, and can be attached thereto (glueing is the preferred attachment method, possibly using a contact glue that holds them directly as the carton blank is

assembled in its collapsed form, but stapling is a possibility). Just which of the strips has the end flaps is generally immaterial - they can be on either or both the length-wise strips and the cross-wise strips - as long as sufficient strips have them to render the array stable.

The carton of the invention may be made from a sheet of any appropriate material (typically a fibre board such as a thin or thick, corrugated or plain card or board made from natural cellulose fibres, or even a wholly or partially synthetic material such as a plastic like a polythene or a polystyrene, or a fibre board coated therewith). The divider strips can likewise be made from a sheet of any appropriate material (though, not having to take any significant stresses, the strip material may be lighter - thinner, and less strong - than the carton material). All this is well-known in the Art, and needs no further comment here.

It is perhaps here worth noting that it is usual to make a blank by cutting, scoring or indenting the flat sheet of material (wit a "forme") from which the carton is formed, this being done so that the blank can then be folded and erected into the carton. To aid in the interpretation of the Figures discussed hereinafter, the creases shown in dot-dashed line form fold in reverse to those shown as dashed lines.

An embodiment of the invention is now described, though by way of illustration only, with reference to the accompanying diagrammatic Drawings in which:

Figures 1A,B show respectively the blank for the carton type known by its International Fibreboard Case Code No: 0714, and (in see-through form) the carton erected therefrom;

Figures 2A,B show respectively the blank for the carton type referred to herein as the "archive" type, and (in see-through form) the carton erected therefrom (it is this type that is used in the present invention);

Figure 3 shows the carton of Figure 2 in partially-erected form;

Figures 4A-C show in section (on the plane IV-IV of Figure 3) three stages in the further erection of the partially-erected carton of Figure 3;

Figures 5A,B show respectively the erected carton of Figure 2B with spacer/divider strips added thereto in accordance with the present invention, first in perspective (from above and one

side) and then from directly above (a top plan view);

Figures 6A-E show the sequence of operations necessary to construct the Figure 5A carton of the invention.

The blank of Figure 1A is of interest merely for the flaps (11), which in the erected carton of (Figure 1B) from the base thereof. In the blank's collapsed state (not shown separately) these flaps are folded up between the walls (12) of the carton, and as the erection process takes place they drop down into place through what is becoming the volume enclosed by the carton. Obviously, if this space was already taken up by an (unfolding) set of spacer/divider strips the flaps would be unable to fold down into place, and the carton couldn't be properly erected. Accordingly, with this type of carton any divider strips to be used therewith must be positioned *after* the carton has been erected; they cannot be fixedly located in place within the collapsed version.

By contrast, the blank and carton of Figure 2 is of that general type on which the present invention is based. It is a double-skinned carton, having inner and outer box sections (11,12). As can be seen, the blank is an elongate oblong, and has along one of its long sides those portions (or panels: 11a,b,c,d) which form the four side wall surfaces (the two ends and the left and right sides) on the inner section and along the other of its long sides those portions (or panels: 12a,b,c,d) which form the four side wall surfaces of the

outer section, these two sets of four panel portions 11,12 being joined by a matching set of four pairs (two sets of four:111a,b,c,d; 112a,b,c,d) of "facing" trapezium portions (each pair - 111a/112a, 111b/112b, etc - mounted with the shorter of the two parallel sides together along a notional line (15) that is the central long axis of the blank and with the longer sides adjacent the related side portion), which trapezium portions fold, concertina-fashion (not shown here) and in an interlocking manner, to form the bottoms of the inner and outer box sections (the 111 trapezium portions are indicated in Figure 2B). In an embodiment - not shown here - with one or more closure flaps, this (or these) would extend from the "free" edge (the lower edge, as viewed) of the side panels 12a,b,c,d.

In its erected state it is held together by the main flap (16: projecting from the outer wall section 12a at the left end as viewed)) being glued to 12d.

Figures 3 and 4 show - in diagrammatic form - how the double-skinned carton of Figure 2B is erected. From its collapsed form (much like that of Figure 5B discussed hereinafter) it is opened out to give the Figure 3 form, in which the inner box 11 is positioned "above" the outer box 12, supported on the four pairs of trapezium sections (111a,112a, etc), and then the inner box is simply pushed down into the outer box, the trapezium sections folding down, in a concertina, interlocking fashion, to form the base of the carton.

Figures 5A,B show a double-skinned carton like that of Figure 2B but with full-height divider strips (as 51)

fixedly located therewithin. There are two lengthwise strips (51l) and three crosswise strips (51c), and at each of its ends each of the two lengthwise strips 51l has a short flap (as 52) which lies flat against and is fixed by glue to the inside surface of the relevant inside box wall 11b or 11d. The crosswise strips 51c reach out to (and may touch) but are not fixed to the walls they extend between, though they are located on the lengthwise strips.

Figure 5A shows the carton in its fully-erected form; the top plan view of Figure 5B shows what it looks like in what is essentially its collapsed form (it is in fact "opened out" slightly to show the divider strips 51 therein).

Finally, the sequence of Figure 6 shows how the blank of Figure 2A is folded, and provided with divider strips, to form the collapsed blank of the invention.

As can be seen, the blank of Figure 6A - which is the same as the blank of Figure 2A - is an elongate oblong, and has along one of its long sides those portions (or panels: 11a,b,c,d) which form the four side wall surfaces (the two ends and the left and right sides) on the inner section 11 and along the other of its long sides those portions (or panels: 12a,b,c,d) which form the four side wall surfaces of the outer section 12, these two sets of four panel portions 11,12 being joined by a matching set of four pairs (two sets of four:111a,b,c,d; 112a,b,c,d) of "facing" trapezium portions (each pair - 111a/112a, 111b/112b, etc - mounted with the shorter of the two parallel sides together along a notional line (15) that is the central

long axis of the blank and with the longer sides adjacent the related side portion).

The longer sides of the outer section trapeziums 112 are joined to the relevant outer box wall sections 12 by a fold line (61), and the first step is to fold the wall sections 12 underneath so that they lie behind the trapezium portions 112. This state is shown in Figure 6B (in an actual production line the sections 11, 111 and 112 would normally be folded over on top, and the carton formed in an "inverted" state).

Next, the pre-prepared collapsed divider strip assembly (62) is laid in position along inner box walls 11b and 11c - which are going to become part of the inner surface of the inner box 11 - and the relevant end flaps 52 are glued to the inner surface 11b. This is shown in Figure 6C. The right-hand (as viewed) end of the blank - the four "d" sections - is then folded over on top (and is glued to the other strip end flaps 52), to give the state shown in Figure 6D. Finally, the left-hand end (as viewed) of the blank - the four "a" sections - is folded over on top of the strips, and the main flap 16 is glued into place on the outside surface of the outer box wall 12d. This is the fully-collapsed state of the carton of the invention, and is shown in Figure 6E.

Erecting the carton is essentially exactly like erecting the more conventional carton of Figure 2B, and as shown in Figures 3 and 4. The carton is opened out from its fully-collapsed state (Figure 6E), passing through a partially-erected state (Figure 5B), into the "open" - rectangular - state like that of Figure 3. The inner box 11 is then simply pushed down into the outer box 12 (as in Figures 4), the trapezium portions folding down to form the double-skinned base as this is done.

Claims

1. A collapsed carton of the "archive" type, wherein fixedly located in position within the portion forming the inner section of the carton are spacer strips disposed to define a cellular array of spaces within the subsequently-erected carton.

2. A carton as claimed in Claim 1 having spacer strips defining a 3x2 or 4x3 cell array.

3. A carton as claimed in either of the preceding Claims, wherein the spacer strips are whole-height strips of card slotted to enable them to be fitted together to define the required array of cells.

4. A carton as claimed in any of the preceding Claims, wherein the spacer strips are fixedly located by some of them having flaps at each end which in use lie flush against and affixed to the relevant strip-normal inside wall surfaces.

5. A carton as claimed in Claim 4, wherein the spacer strip flaps are glued to the inside wall surfaces.

6. A collapsed carton as claimed in any of the preceding Claims and substantially as described hereinbefore.

7. A carton, being an erected form of a collapsed carton as claimed in any of the preceding Claims.

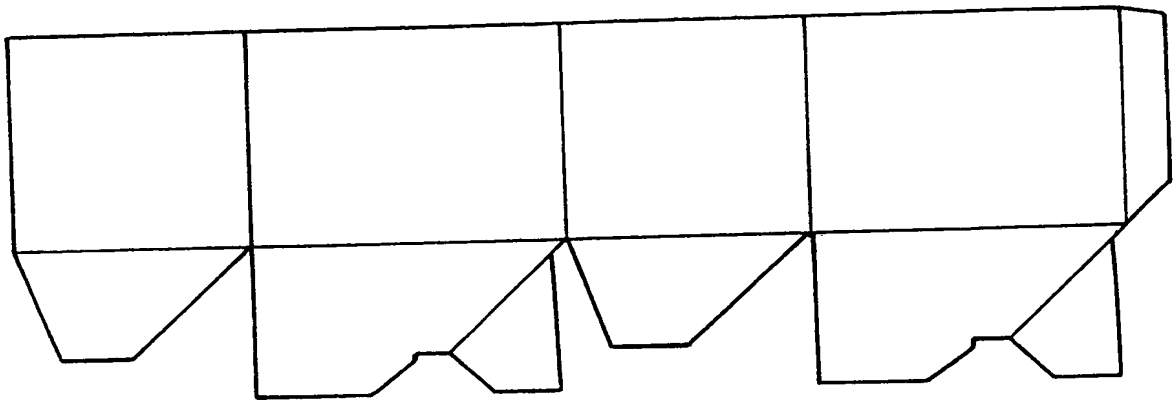


Fig. 1A

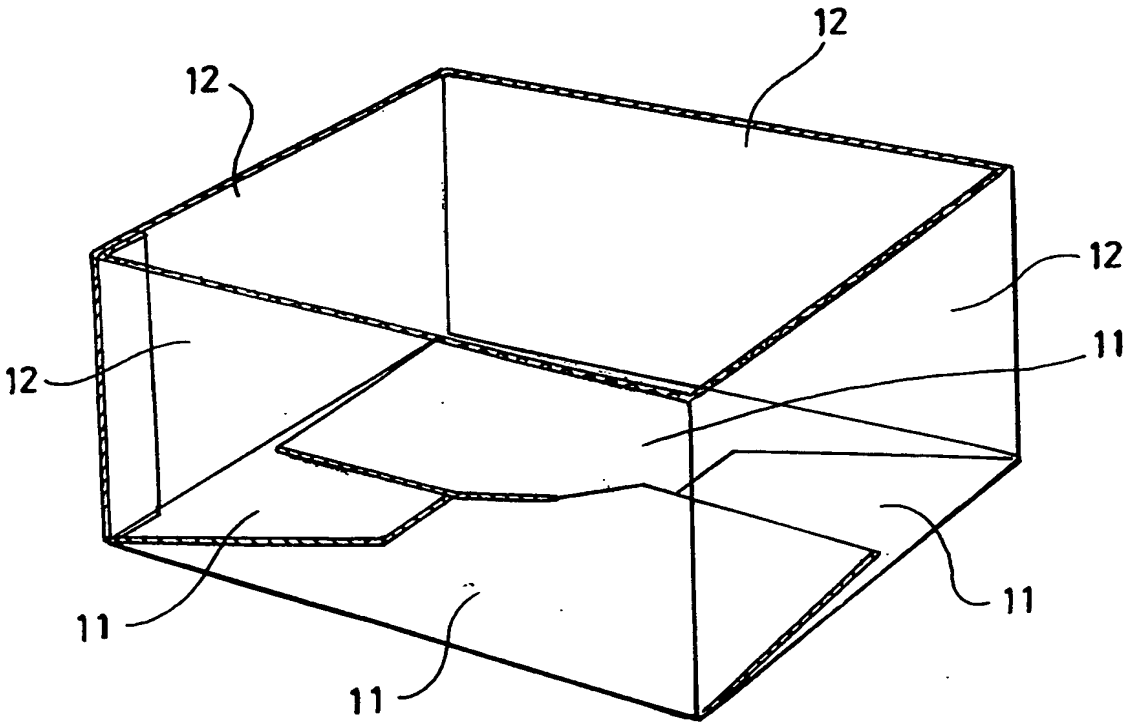
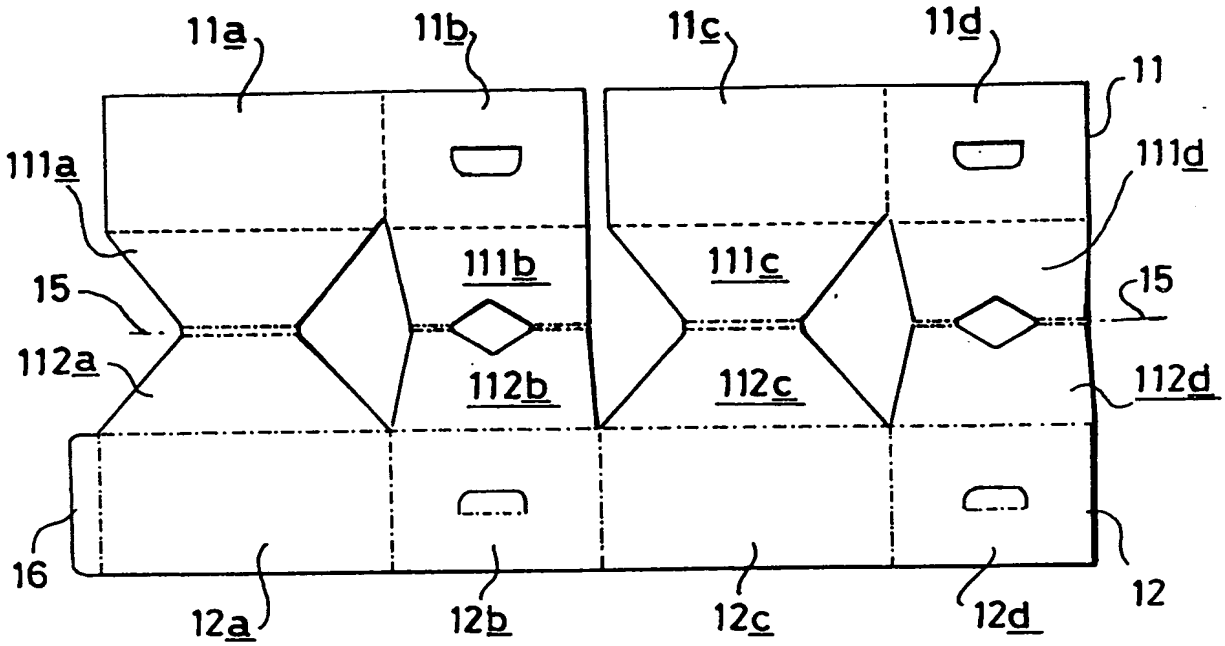


Fig. 1B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11b
11c
11d
11
111a
111d
111b
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15
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112a
112b
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112d
16
12a
12b
12c
12d
12

Fig. 2A

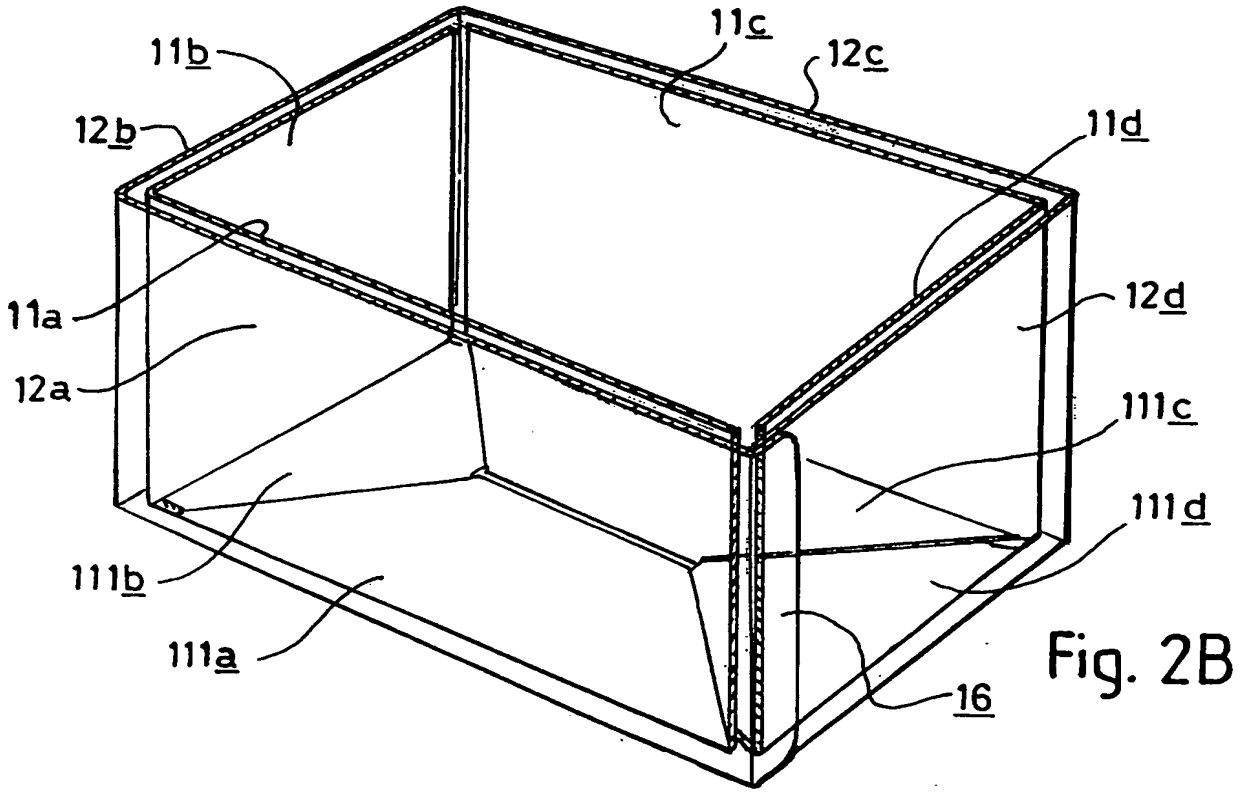
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Fig. 2B

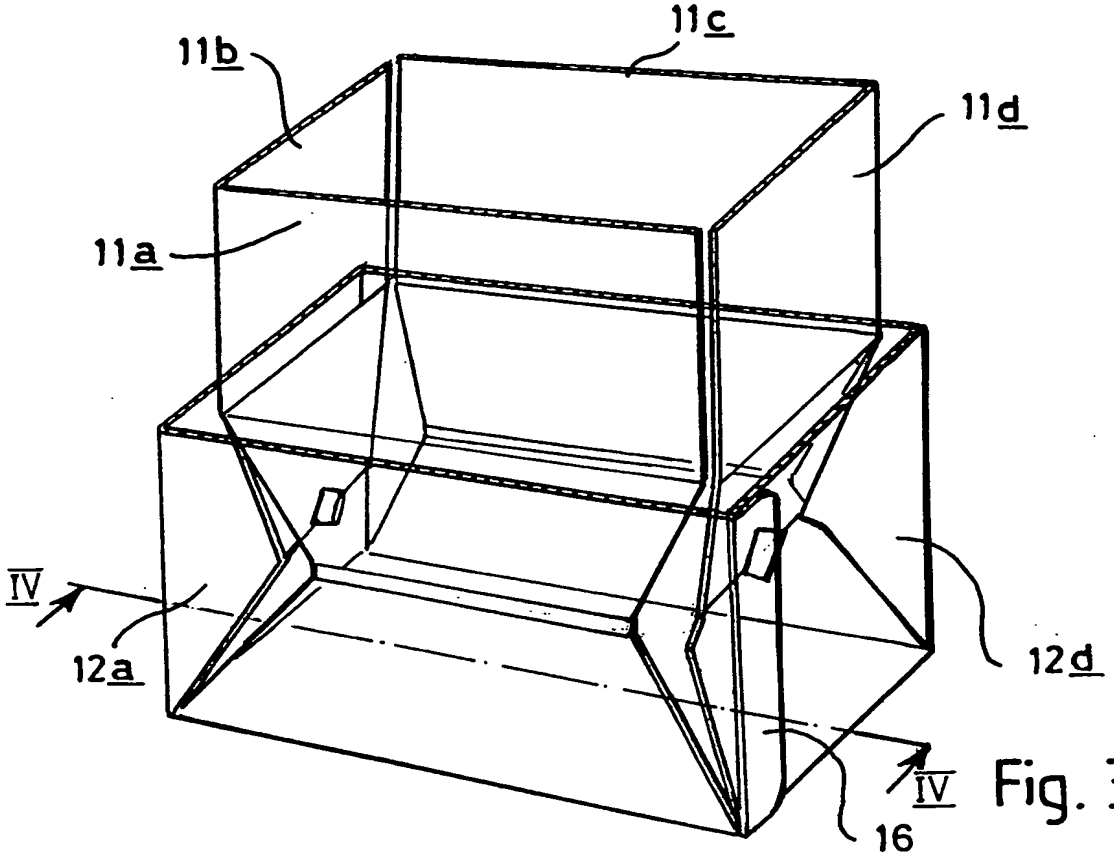


Fig. 3

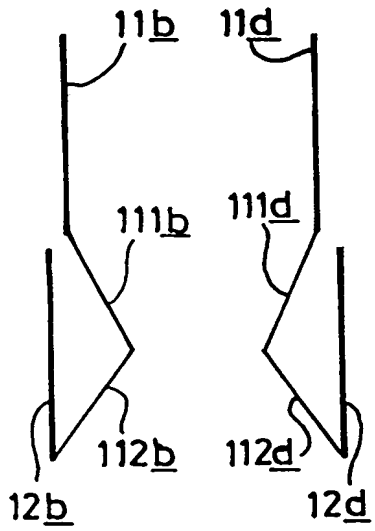


Fig. 4A

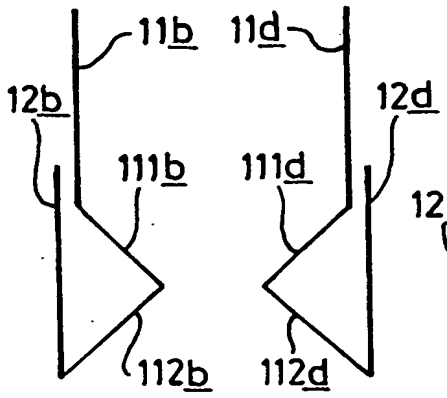


Fig. 4B

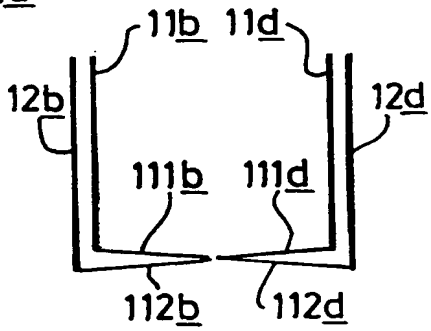
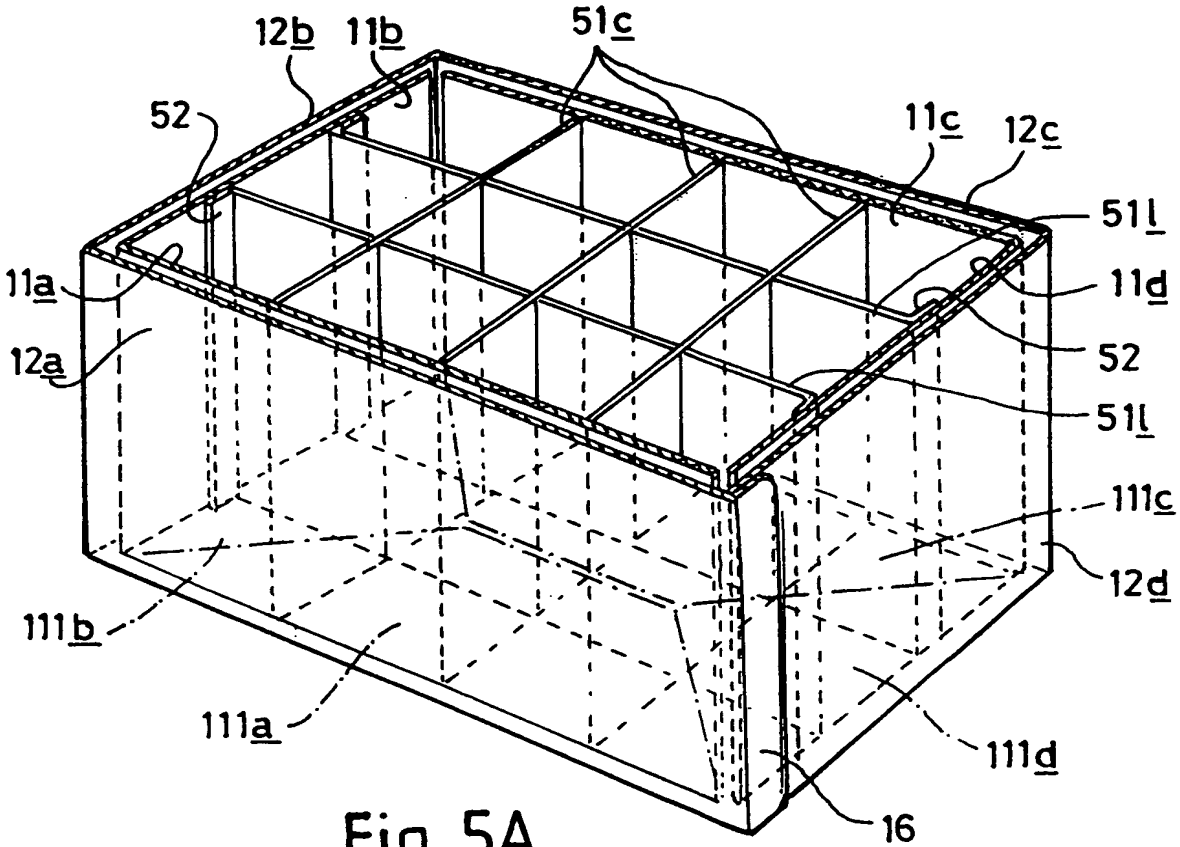


Fig. 4C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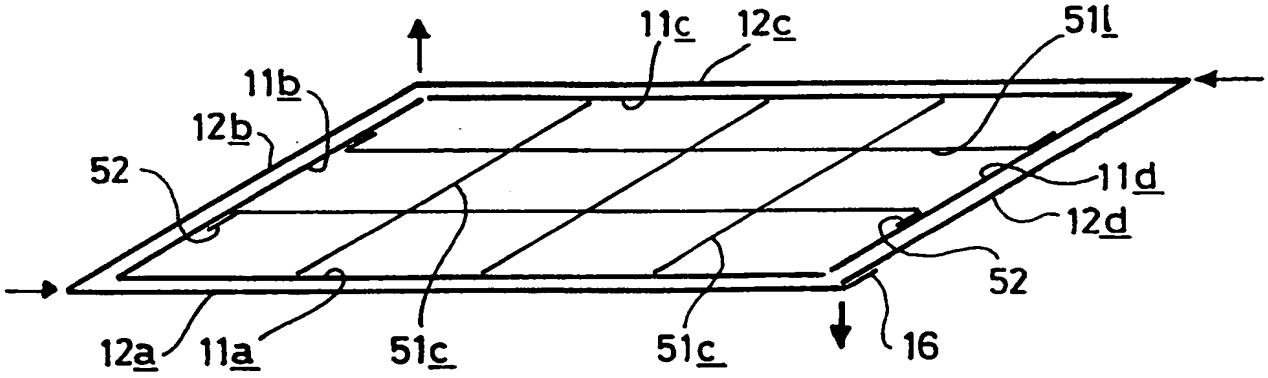
11b
51c
52
11c
12c
51l
11a
11d
12a
52
51l
111c
12d
111b
111a
111d
16

Fig. 5A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11d
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12a
11a
51c
51c
16

Fig. 5B

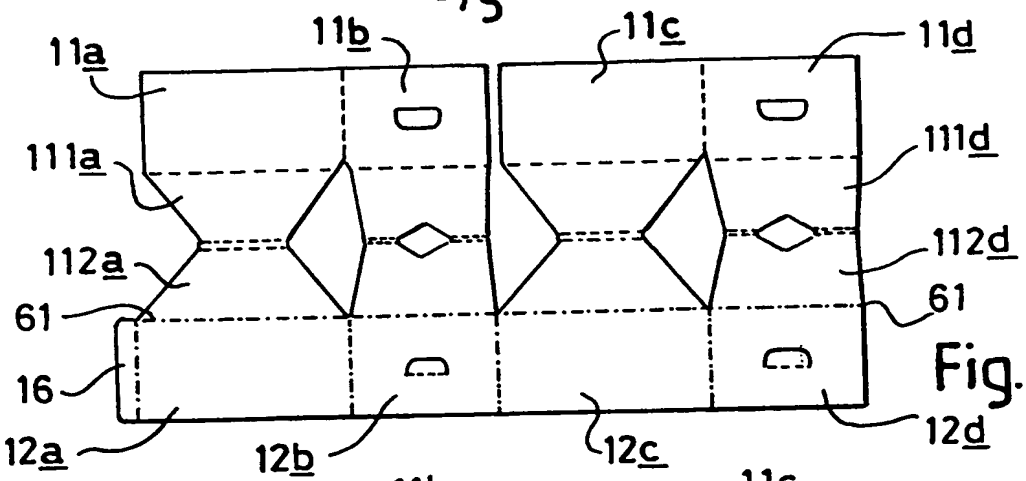

Fig. 6A

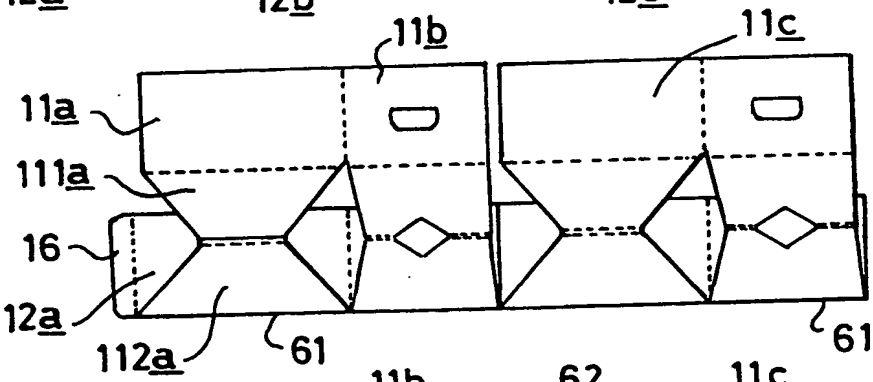

Fig. 6B

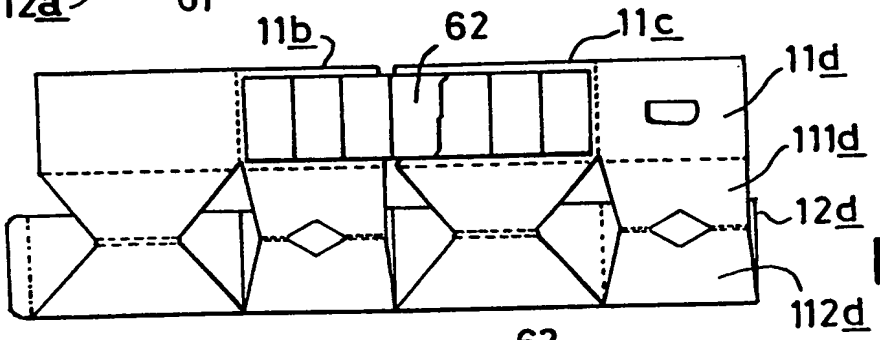

Fig. 6C

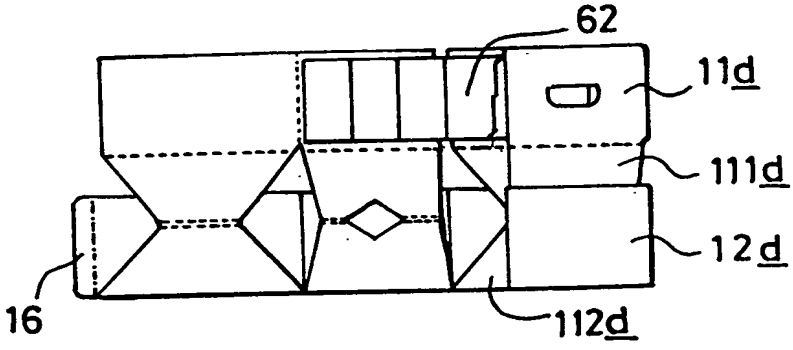

Fig. 6D

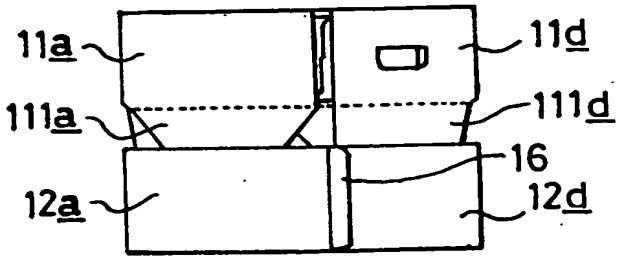

Fig. 6E

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 99/02562

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D5/48 B65D5/02 B65D5/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 406 380 A (PAIGE) 27 September 1983 (1983-09-27) the whole document	1-5,7
Y	US 3 011 672 A (VESAK) 5 December 1961 (1961-12-05) column 2, line 35 -column 3, line 54; figures	1-5,7
A	GB 2 322 357 A (TRIO) 26 August 1998 (1998-08-26) claim 1; figures	1
A	GB 2 094 762 A (UNILEVER) 22 September 1982 (1982-09-22) claim 4; figures	2,3

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 November 1999	17. 11. 99
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Newell, P

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 99/02562

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 6
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
Rule 6.2 (a) PCT.

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 99/02562

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4406380 A	27-09-1983	US 4325493 A	20-04-1982
US 3011672 A	05-12-1961	NONE	
GB 2322357 A	26-08-1998	NONE	
GB 2094762 A	22-09-1982	NONE	